

### **REMARKS**

Claims 1, 7-9, 12-13, and 65 are pending on the merits in this application for the Examiner's review and consideration upon entry of this paper. Claim 1 has been amended to more clearly recite the claimed invention. Support for the amendments can be found in the application as-filed. Claims 11-12 have been cancelled without prejudice. Claims 2-6 and 14-64 are withdrawn without prejudice. Applicants reserve the right to file one or more divisional or continuation applications to any canceled or withdrawn subject matter. No new matter has been added by the amendments.

#### **I. The Rejections Under 35 U.S.C. § 112, First Paragraph**

Claims 1, 7-13 and 65 are rejected on pages 4-6 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. According to the Office Action, the specification provides no chemical structures or description of the compounds described as "prodrugs" that may be used within the context of the present invention. Applicants respectfully traverse this rejection for at least the following reasons.

Applicants respectfully point out that the specification has clear and specific description of "prodrugs" as "...any pharmaceutically acceptable form (such as an ester, amide, salt of an ester, salt of an amide or a related group) of the compounds described herein that, upon administration to a patient, provides the active compound." and "... compounds that are metabolized, for example, hydrolyzed or oxidized, in the host to form the compound of the present invention. Typical examples of prodrugs include compounds that have biologically labile protecting groups on a functional moiety of the active compound. Prodrugs include compounds that can be oxidized, reduced, aminated, deaminated, hydroxylated, dehydroxylated, hydrolyzed, dehydrolyzed, alkylated, dealkylated, acylated, deacylated, phosphorylated, dephosphorylated to produce the active compound. The compounds of this invention possess antiviral activity against a togavirus and/or coronavirus or are metabolized to a compound that exhibits such activity." (See specification at page 62, first *paragraph* and page 63, third *paragraph*). These descriptions of prodrugs clearly convey claimed invention in sufficient detail such that one skilled in the art can

reasonably conclude that the inventor had possession of the claimed invention at the time the application was filed.

Accordingly, Applicants respectfully request that the rejection of claims 1, 7-13 and 65 under 35 U.S.C. § 112, first paragraph, be reconsidered and withdrawn.

## **II. The Rejections Under 35 U.S.C. § 103**

Claims 1, 9-13, and 65 are rejected on pages 7-9 of the Office Action under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent No. 5,962,437 to Kucera *et al.* ("Kucera"). According to the Office Action, Kucera discloses methods of treating viral infections, and in particular HIV-1, hepatitis B virus, and herpes viruses, comprising administering an infection-combating amount of a phospholipid or phospholipid derivative which has different length of the alkyl chains at R<sub>1</sub> and R<sub>2</sub> than the compounds claimed in the instant invention. The Office Action further alleges that extending alkyl chain lengths would have been obvious to one of ordinary skill in the art because members of homologous series of chemical compounds demonstrate the same principal characteristics, which vary gradual from member to member.

Applicants respectfully submit that independent claim 1, as amended, is patentable over Kucera. Kucera neither teaches nor suggests the treatment of a *togavirus* or a *coronavirus* using the compounds of Formula (I) as recited by the pending claims.

Accordingly, Applicants respectfully submit that the rejections of claim 1 and the corresponding dependent claims 7-9 and 12-13 under 35 U.S.C. § 103(a) should be reconsidered and withdrawn.

Claims 7-8 are rejected on pages 9-10 of the Office Action under 35 U.S.C. § 103(a) as allegedly obvious over Kucera in view of Holmes *et al.* New England Journal of Medicine, 2003, Vol 348, No. 20, pages 1948-1951 ("Holmes").

According to the Office Action, Kucera suggests and motivates the treatment of any virus type, especially membrane-containing or envelope containing viruses and Holmes teach that SARS corona virus contains a viral envelope. The Office Action further alleges that it would have been *prima facie* obvious at the time of the invention to treat a corona virus, particularly a SARS corona virus, using the methods of Kucera

Applicants respectfully traverse this rejection for at least the following reasons.

Kucera does not teach or suggest applying lipid analogs to treat *coronavirus* infections as recited by the pending claims. Kucera merely hypothesizes that the compounds disclosed therein are believed to attach to the cell membrane and thus may be effective against infections caused by envelop-containing viruses. However, Kucera does not identify *coronavirus* in its list of envelop-containing viruses. And, given the complexity of the virology art a person of ordinary skill in the art would not have a reasonable motivation after reading Kucera to use the claimed compounds for treating coronaviruses.

Holmes does not remedy the deficiencies of Kucera. Although Holmes discloses that *coronavirus* has an envelope structure Holmes also fails to disclose the mechanism of *coronavirus* with the host cell. Due to the large number of envelope-structured viruses, the interactions of envelop-structured viruses with the host cell can occur in many different and unpredictable ways. A number of factors, including physical properties of the host cells, concentrations of cytokines, and dynamics of the viruses can significantly affect the interaction of the enveloped structured virus and the host cell. Considering the failure of Kucera or Holmes to provide working mechanism of *coronavirus* and the unpredictable nature of the virology art, a person with ordinary skill in the filed would not have been motivated at the time of the invention to combine the teachings of Kucera and Holmes to reach the invention defined in claims 7-8 with reasonable expectation of success.

For at least the above reasons, Kucera and/or Holmes alone or in combination do not render claims 1, 7-9, 12-13 and 65 obvious. Applicants respectfully submit that the rejections of claims 1, 7-9, 12-13 and 65 under 35 U.S.C. § 103 (a) should be reconsidered and withdrawn.

### III. Conclusion

It is respectfully submitted that the rejections to the claims have been overcome. Should the Examiner disagree, Applicants respectfully request a telephonic or in-person interview with the undersigned attorney to discuss any remaining issues and to expedite the eventual allowance of the claims.

Except for issues payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account 50-0310.

Dated: **July 7, 2008**  
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Respectfully submitted,  
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